

LOCKOUT TAGOUT POCKET GUIDE

Published and Distributed by
GENIUM PUBLISHING CORPORATION
One Genium Plaza
Schenectady, NY 12304-4690 USA
(518) 377-8854

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ISBN 0-931690-59-5
Printed in the United States of America

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I. INTRODUCTION

“Slick the Pick” Wilson is what my friends call me. There’s not a lock I can’t pick – from Junior’s school locker to the doors at the bank – I’ve done ’em all.

Now, don’t get me wrong, it’s all done on the square. I’m a master locksmith – just like my father and his father before him. I’ve got my college degree, and my business now has 15 employees. My customers, who call me Mr. Wilson, or just Freddy, range from private individuals to major corporations. You see, I not only reunite forgetful motorists with their car keys, I help design systems that are used to secure or isolate energy sources on process equipment. Let’s say you have a broken machine to fix in your plant. You turn off the power to it and you fix it. Right? But what happens if you’ve got your fingers in the thing and somebody turns it back on. Ouch! That’s why it’s smart to “tag out” critical electrical switches with a sign that says to leave the switch OFF. To be even more safe, you can put a lock on the switch. That’s called a “lock out.”

And that’s why you’re reading this now. Your employer wants you to be aware of the **requirements** for locking-out or tagging-out (controlling) energy sources during servicing and/or maintaining of machines and equipment. What requirements? Why the requirements that are spelled out in the Occupational Safety and Health Standard 1910.147, entitled “The Control of Hazardous Energy (lockout/tagout).” And who better to walk and talk you through it than me, “Slick the Pick” Wilson?

We’ll look at the Standard and see how it’s designed to help keep you safe from the potential hazards posed by machines and equipment.

We’ll discuss the various types of energy sources and how to keep them from harming you. And, we’ll look at a typical energy-control program, including lockout vs. tagout along with lockout/tagout equipment. And we’ll discuss the requirements for training and retraining to keep you sharp and safe.

We’ll see how to apply the program both to lockout/tagout procedures and finally, to procedures for restoring power.

II. HAZARDOUS ENERGY SOURCES

The unexpected activation of machinery or process equipment during maintenance operations can have tragic results. That's why the first point made under the lockout/tagout program is to make sure you, the employee, are aware of the type(s) of energy sources and the hazards associated with those energy sources that need to be controlled.

"How many kinds of energy sources are there?" you ask? Let's count 'em.

A. ELECTRICAL ENERGY

This is usually the first one everybody thinks of. Actually there are two types, generated and static.

Generated Electric Power

Found at the main source of electricity to the machine or equipment, generated electrical power could also be found in various circuitry within the machine or equipment. Think of electric power as the **flow** of electrons in a conductor – because, well, that's what it is.

And don't forget generated energy that's been stored, like in batteries or capacitors. I could show you a nasty scar on my wrist I got off a car battery. Happened when I was a kid. Grounded the metal band of my watch on it. But, I'm older and wiser now. If you want to get older and wiser too, I suggest you read on.

Static Electricity, on the other hand, remains **fixed** on the surface of an object. Static electricity can be found in electrostatic precipitators that are commonly used for dust collection by heavy industry to control air pollution. "Hey, Slick" you ask, "Is static electricity that dangerous?" Well, lightning is actually the discharge of static electricity. And anything that can discharge that kind of "juice" demands respect, in my opinion.

Anyway, whether it's static or flowing, if you don't want to get French fried, you better be aware of your employer's Energy Control Program and follow it.

III. ENERGY CONTROL PROGRAM

The Energy Control Program consists of the energy control procedures, employee training on those procedures, and periodic inspections relating to the procedures.

Sounds like this law is a procedure thing, doesn't it? Well, you're right! And the Energy Control Program is the sum of all of these procedures. And one of the most important elements of the program to consider is whether to use locks or tags to "control hazardous energy."

A. LOCKOUT VERSUS TAGOUT

You'd hardly believe there could be an argument here, could you? As a general rule, lockout is the preferred method over tagout for the following reasons:

- *Locks are hard to bypass.* — It would require a major effort and a pair of hefty bolt cutters to compromise a lock. Tags can be pretty easily defeated.
- *Tags only warn.* — They only serve as a warning and are not to be considered a "safety device" whereas locks are.
- *Tags may be easily lost or damaged.* — Tags can be damaged by environmental or physical hazards like chemicals or abrasives.
- *Locks speak everyone's language.* — You're assuming everyone can read. Of course you can, or you'd be using this book just to swat flies. Ah, but you are reading English. Let's say you went to China to work on some made-in-the-USA machine, and you brought your big red and white "Please-don't-turn-this-on-or-you-will-electrocute-me" warning tag. To your Chinese co-worker standing next to you, it probably wouldn't mean much, would it? Just like his warning tag in Chinese wouldn't mean much to you.

Now I know you're thinking - "Tag-schmag" who needs them? Although the Standard agrees that lockout is the preferred method when the energy isolation device is capable of being locked out, it recognizes that there are situations where tagout systems are an acceptable choice. For example, when:

IV. ENERGY CONTROL PROCEDURES AND APPLICATION MATERIALS

The written Energy Control Procedures are kind of like the game plan for lockout/tagout. And just like in sports, everyone's "playbook" is a little different.

Your employer is responsible for issuing clear, specific instructions outlining the scope, purpose, authorization, rules, and techniques to be used for the control of hazardous energy sources at your place of work.

While certain procedures will vary because of the wide diversity of machines and processes found in industry today, there are certain basic rules and requirements that will be the same for everyone. Let's take a look.

A. PURPOSE

This is what I call the "mission statement." It can be as brief or as long as your employer wants it – whatever it takes to convey the message that there are important procedures covering the lockout of energy isolation devices wherever maintenance or servicing is done on machines or equipment. It also has to be clear that compliance by everyone is a must and violation of any part of the procedures or program is neither permissible nor acceptable. If you are the person responsible for doing the actual servicing or maintaining, you want to be sure that your fellow employees will be just as anxious and willing as you are to comply with all procedures.

B. SHUTDOWN/ISOLATION

This is the orderly procedure for preparing the machine or equipment for the application of the lockout and/or tagout devices. While the specifics may change, based on your particular situation, here are some basics:

- Notification — First, notify all affected personnel that servicing and maintenance on equipment and shutdown in preparation for lockout/tagout is about to occur. You can't just go over and pull the switch on a piece of equipment or process when it affects the actions

V. ENERGY-CONTROL SITUATIONS NOT REQUIRING DOCUMENTED PROCEDURES

And that's the procedure Gee Whiz manufacturing Company uses to control and lockout the energy source for the old "Spin Deluxe 2200 Mixer." Pretty straightforward wasn't it?

But, you say, "The shift I work on is even simpler – all I gotta do is pull a plug." Well, now, you'd think that anyone would be able to figure out that method of energy control. I know what you mean. But, you still have to have a written Energy Control Program, no matter what. A documented procedure like the one at Gee Whiz Manufacturing Company may not be needed. But, and this is a big "but," all the following eight conditions must be met by the employer before any employees drop documenting a procedure for a given machine or piece of equipment:

- 1) *No stored (potential) or residual energy* — The machines or equipment must not have any "hidden" energy sources that are going to come up and bite you. You remember – things like springs, capacitors, etc.
- 2) *Single energy source* — Like that plug you mentioned, you've got to have a single, readily identifiable, easy-to-isolate, energy source.
- 3) *Complete isolation* — That simple energy source, once locked up (like with one of the plug-type locks you saw earlier), must completely deenergize and deactivate the machine or equipment.
- 4) *Isolated lockout*— The machine or equipment must still be isolated and locked out during service or maintenance. Remember, just because it's simple, doesn't make it any less dangerous.
- 5) *Single lockout device* — If you only have a simple, single source of energy, then you should only need one lock, right?
- 6) *Control* — The lockout device must be in the control of the authorized employee doing the repair or service.

VI. TRAINING

Now I know I don't have to tell you again about how important it is to have a comprehensive, effective Energy Control Program and Energy Control Procedures that are a part of that program. But, you'll remember that there's another equally important part of the Energy Control Program, training. And the Occupational Safety and Health Administration (OSHA), which is responsible for enforcing the Standard, says, and I quote, "OSHA considers these training requirements to be of critical importance in helping to ensure that the applicable provisions of the hazardous energy control procedures are known, understood, and strictly adhered to by employees." Need I say more? I don't think so.

But who gets trained on what? Well, it's broken down into three employee groups. They are, in descending order of required knowledge:

- *Authorized Employee* — If you are an authorized employee, you're the person who will physically be performing the lockout/tagout and servicing of the machine or equipment. So you better know it all.
- *Affected Employee* — If you fall under this category, you may be the person who operates the machine or equipment on which servicing or maintenance is being performed. Or perhaps your job requires you to be in the area in which servicing or maintenance is being performed.
- *Other Employee* — I know it doesn't sound like much of a "title," but it simply means you work in an area of the plant other than where maintenance or service is being performed on the deenergized machine or equipment.

A. Training Requirements

Let's take a look at the what, when, and why (I like to call them the three W's) of training for each employee:

Authorized Employee

What ? — Complete knowledge of Energy Control Procedures including, but not limited to:

- Hazardous energy recognition

VII. SUMMARY

Well, folks, that's about all old Slick has got to tell you about lockout/tagout. Dare I repeat myself and say that a lock or tag by itself just isn't goin' to do you any good. It's the proper isolation of the equipment from the energy source, following established procedures and training that will keep you going "strong and long."

Anyway, let me leave you with the final ten of Slick's Picks. Keep 'em with you; it might help jog your memory:

1. Never attempt lockout/tagout procedures unless you have been trained and certified by your employer under an approved Energy Control Program.
2. Be sure to identify all potentially hazardous energy sources such as mechanical, potential (stored), chemical, and thermal as well as electrical.
3. Never just pull a fuse or use a selector switch (on/off switch) as a means of energy isolation.
4. Always be sure all lockout/tagout devices are compatible with the environment in which they will be used i.e., corrosive, humid, etc.
5. Always test the equipment or machines after lockout/tagout to ensure all potentially hazardous energy sources are isolated prior to maintenance or repair.
6. When working with others, never rely on someone else's lockout/tagout devices for your safety. If you don't have a dedicated lockout/tagout device, have your employer provide one.
7. Never loan or share your lock, combination, or key with anyone else.
8. Never attempt to remove lockout/tagout devices placed by others.
9. If lockout/tagout procedures remain in effect between work shifts, never remove your lockout/tagout devices until your relief has installed his/her own lockout/tagout device.
10. Always be sure the work area is free from nonessential items and that all personnel are safely positioned prior to removing lockout/tagout devices and restoring energy.

VIII. GLOSSARY

Affected Employee — An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized Employee — A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on those machines or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out — An energy-isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy-isolating devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy-control capability.

Cutout Box — An enclosure designed for surface mounting and having swinging doors or covers secured directly to – and telescoping with – the walls of the box proper.

Energized — Connected to an energy source or containing residual or stored energy.

Energy Control Procedure — Written instructions adopted by the employer that describe how equipment and procedures are to be shut down for lockout/tagout and later released from lockout/tagout for safe startup.

Energy Control Program — A safety program adopted by the employer that includes energy control procedures plus provisions for inspecting the procedures and training employees for lockout/tagout.

Energy Isolating Device — A mechanical device that physically prevents the transmission or release of energy, including – but not limited to – the following: a manually operated electrical circuit

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IV. ENERGY CONTROL PROCEDURES AND APPLICATION MATERIALS

The written Energy Control Procedures are kind of like the game plan for lockout/tagout. And just like in sports, everyone's "playbook" is a little different.

Your employer is responsible for issuing clear, specific instructions outlining the scope, purpose, authorization, rules, and techniques to be used for the control of hazardous energy sources at your place of work.

While certain procedures will vary because of the wide diversity of machines and processes found in industry today, there are certain basic rules and requirements that will be the same for everyone. Let's take a look.

A. PURPOSE

This is what I call the "mission statement." It can be as brief or as long as your employer wants it – whatever it takes to convey the message that there are important procedures covering the lockout of energy isolation devices wherever maintenance or servicing is done on machines or equipment. It also has to be clear that compliance by everyone is a must and violation of any part of the procedures or program is neither permissible nor acceptable. If you are the person responsible for doing the actual servicing or maintaining, you want to be sure that your fellow employees will be just as anxious and willing as you are to comply with all procedures.

B. SHUTDOWN/ISOLATION

This is the orderly procedure for preparing the machine or equipment for the application of the lockout and/or tagout devices. While the specifics may change, based on your particular situation, here are some basics:

- Notification — First, notify all affected personnel that servicing and maintenance on equipment and shutdown in preparation for lockout/tagout is about to occur. You can't just go over and pull the switch on a piece of equipment or process when it affects the actions

Sample Lockout Procedure for:

**GEE WHIZ MANUFACTURING
COMPANY**

Type of Equipment: Spin Deluxe #2200 Mixer.

Property Tag #: 12745.

Work to be performed: Blade Alignment.

Authorized Employee
Responsible: John Smith.
name (print)/signature/date

Purpose — This procedure establishes the minimum requirements for the lockout of energy-isolating devices whenever maintenance or servicing is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

Compliance — All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment that is locked out to perform servicing or maintenance shall not attempt to start, energize or use that machine or equipment.

Notice — **Failure to comply with all parts of lockout/tagout procedures may result in immediate dismissal.**

LOCKOUT SEQUENCE

Step 1. Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.

Affected Employees:

Name: J. Jones K. Smith B. Barnes
Job Title: Mixer Bagger Quality Control

Methods to use for notification:

	<u>Check</u>
Sound "shut down" horn	<input checked="" type="checkbox"/>
Announce over "page system"	<input checked="" type="checkbox"/>
Post notice in work area	<input checked="" type="checkbox"/>

Step 2. The authorized employee shall refer to the company procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

Energy to be controlled:

<u>Type</u>	<u>Hazard</u>	<u>Method of Control</u>
Kinetic	Blade Rotation at main drive shaft	U-Joint disconnect
Electric	440 Volts energy control	Shut off master
Others	None	

Step 3. If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open switch, close valve, etc.).

Methods for Machine Shutdown:

Type:	OFF Button	Blade lockout
Location:	Control Panel	Control panel

Step 4. Engage the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).

Energy isolation devices used and locations:

Type: Master, Inc. Control U-Joint
Board removal

Location: Control Board A Between main
drive shaft/output shaft

Step 5. Lock out the energy isolating device(s) with assigned individual lock(s).

<u>Application of Lockout</u>	<u>Check</u>
Apply padlock to control Box A	[X]
Lock removed U joint in Parts Cabinet B	[X]
Apply lockout ID Tags to Box A and Cabinet B	[X]

Step 6. Stored or residual energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

Type of Stored or Potential Energy:

<u>Type</u>	<u>Present</u>	<u>Method of Restraint</u>
Pressure:		
Hydraulic	No	Dissipation
Pressurized	No	Dissipation
Vacuum	No	Dissipation
Thermal	No	Dissipation
Springs	No	Dissipation
Gravity	No	Dissipation
Electrical	No	Dissipation
Capacitors	No	Dissipation
Battery	No	Dissipation
Other	No	Dissipation

Step 7. Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

CAUTION: Return operating control(s) to neutral or OFF position after verifying the isolation of the equipment.

Method Used to Verify Isolation:

Method	Check	Remarks
Start-up Attempt	[X]	
Test	[X]	
Visual inspection	[X]	

Step 8. Lockout is now complete.

Restoring Equipment to Service

When the servicing or maintenance is completed, and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken:

- 1) Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.
- 2) Check the work area to ensure that all employees have been safety positioned or removed from the area.
- 3) Verify that the controls are in no harm.
- 4) Remove the lockout devices and reenergize the machine or equipment.

NOTE: Some forms of blocking may require removal.

- 5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

Method of Notification _____.

Signature _____ Date _____.

V. ENERGY-CONTROL SITUATIONS NOT REQUIRING DOCUMENTED PROCEDURES

And that's the procedure Gee Whiz manufacturing Company uses to control and lockout the energy source for the old "Spin Deluxe 2200 Mixer." Pretty straightforward wasn't it?

But, you say, "The shift I work on is even simpler – all I gotta do is pull a plug." Well, now, you'd think that anyone would be able to figure out that method of energy control. I know what you mean. But, you still have to have a written Energy Control Program, no matter what. A documented procedure like the one at Gee Whiz Manufacturing Company may not be needed. But, and this is a big "but," all the following eight conditions must be met by the employer before any employees drop documenting a procedure for a given machine or piece of equipment:

- 1) *No stored (potential) or residual energy* — The machines or equipment must not have any "hidden" energy sources that are going to come up and bite you. You remember – things like springs, capacitors, etc.
- 2) *Single energy source* — Like that plug you mentioned, you've got to have a single, readily identifiable, easy-to-isolate, energy source.
- 3) *Complete isolation* — That simple energy source, once locked up (like with one of the plug-type locks you saw earlier), must completely deenergize and deactivate the machine or equipment.
- 4) *Isolated lockout*— The machine or equipment must still be isolated and locked out during service or maintenance. Remember, just because it's simple, doesn't make it any less dangerous.
- 5) *Single lockout device* — If you only have a simple, single source of energy, then you should only need one lock, right?
- 6) *Control* — The lockout device must be in the control of the authorized employee doing the repair or service.

VI. TRAINING

Now I know I don't have to tell you again about how important it is to have a comprehensive, effective Energy Control Program and Energy Control Procedures that are a part of that program. But, you'll remember that there's another equally important part of the Energy Control Program, training. And the Occupational Safety and Health Administration (OSHA), which is responsible for enforcing the Standard, says, and I quote, "OSHA considers these training requirements to be of critical importance in helping to ensure that the applicable provisions of the hazardous energy control procedures are known, understood, and strictly adhered to by employees." Need I say more? I don't think so.

But who gets trained on what? Well, it's broken down into three employee groups. They are, in descending order of required knowledge:

- *Authorized Employee* — If you are an authorized employee, you're the person who will physically be performing the lockout/tagout and servicing of the machine or equipment. So you better know it all.
- *Affected Employee* — If you fall under this category, you may be the person who operates the machine or equipment on which servicing or maintenance is being performed. Or perhaps your job requires you to be in the area in which servicing or maintenance is being performed.
- *Other Employee* — I know it doesn't sound like much of a "title," but it simply means you work in an area of the plant other than where maintenance or service is being performed on the deenergized machine or equipment.

A. Training Requirements

Let's take a look at the what, when, and why (I like to call them the three W's) of training for each employee:

Authorized Employee

What ? — Complete knowledge of Energy Control Procedures including, but not limited to:

- Hazardous energy recognition

VII. SUMMARY

Well, folks, that's about all old Slick has got to tell you about lockout/tagout. Dare I repeat myself and say that a lock or tag by itself just isn't goin' to do you any good. It's the proper isolation of the equipment from the energy source, following established procedures and training that will keep you going "strong and long."

Anyway, let me leave you with the final ten of Slick's Picks. Keep 'em with you; it might help jog your memory:

1. Never attempt lockout/tagout procedures unless you have been trained and certified by your employer under an approved Energy Control Program.
2. Be sure to identify all potentially hazardous energy sources such as mechanical, potential (stored), chemical, and thermal as well as electrical.
3. Never just pull a fuse or use a selector switch (on/off switch) as a means of energy isolation.
4. Always be sure all lockout/tagout devices are compatible with the environment in which they will be used i.e., corrosive, humid, etc.
5. Always test the equipment or machines after lockout/tagout to ensure all potentially hazardous energy sources are isolated prior to maintenance or repair.
6. When working with others, never rely on someone else's lockout/tagout devices for your safety. If you don't have a dedicated lockout/tagout device, have your employer provide one.
7. Never loan or share your lock, combination, or key with anyone else.
8. Never attempt to remove lockout/tagout devices placed by others.
9. If lockout/tagout procedures remain in effect between work shifts, never remove your lockout/tagout devices until your relief has installed his/her own lockout/tagout device.
10. Always be sure the work area is free from nonessential items and that all personnel are safely positioned prior to removing lockout/tagout devices and restoring energy.

VIII. GLOSSARY

Affected Employee — An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized Employee — A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on those machines or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out — An energy-isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy-isolating devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy-control capability.

Cutout Box — An enclosure designed for surface mounting and having swinging doors or covers secured directly to – and telescoping with – the walls of the box proper.

Energized — Connected to an energy source or containing residual or stored energy.

Energy Control Procedure — Written instructions adopted by the employer that describe how equipment and procedures are to be shut down for lockout/tagout and later released from lockout/tagout for safe startup.

Energy Control Program — A safety program adopted by the employer that includes energy control procedures plus provisions for inspecting the procedures and training employees for lockout/tagout.

Energy Isolating Device — A mechanical device that physically prevents the transmission or release of energy, including – but not limited to – the following: a manually operated electrical circuit